Shared Content on Facebook Often Propagates Inaccurate or Misleading Information Regarding Covid-19

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Abstract

With billions of monthly active users, Facebook has an unprecedented ability for the dissemination of information. In healthcare, attempts have been made to utilize this tool for goals such as predicting disease onset; however, shared articles that omit information or propagate incorrect statements may have a negative effect. The goal of this study was to assess the accuracy of information in the nascent months of the 2019-2020 Covid-19 outbreak.

The fifty most popular articles on Facebook for the period between November 2019 and March 25, 2020 (as collated by Buzzsumo- a social media analyzing tool) were analyzed by independent researchers and sorted into classifications for accurate, inaccurate and misleading. Following evaluation, 32% of articles were deemed to be accurate, 18% inaccurate, and 50% misleading (as defined by containing both accurate and inaccurate information). To restate, 68% of the 50 most popular articles on Facebook were not accurate during the study period. Impressions, shares and comments on Facebook in a summation of inaccurate and misleading articles were also analyzed in separate fashion and found to be 71.44%, 74.97%, and 80.22% respectively. These numbers outpace the 68% of total articles for which these types of stories account.

In addition, shares were individually assessed as they indicate a desire to propagate the information forward on the part of the user, and were found to have occurred 6.61 million times in the inaccurate and misleading group compared to 2.2 million for accurate articles, for a cumulative rate of 74.9% of shares, again outpacing the 68% expected.

There is a high rate of both inaccurate and misleading information related to the Covid-19 outbreak on Facebook, as assessed by physician reviewers. This information is not only more prevalent than the accurate information, but also received more engagement via overall impressions, as well as shares and comments. Although there is no clear remedy for this phenomenon, its implications range from general distrust to non-adherence to precaution guidelines or required actions. There is also a question regarding Facebook's policing of itself and the content on its site, as well as that content published to it from other websites.

Introduction

Social media has tremendous reach, and, with 2.5 billion monthly active users[1], Facebook can propagate information across a vast swath of the global community. Although Facebook has many potential benefits for healthcare, such as predicting disease onset or exacerbation, or allowing for social media-based health interventions[2], it is also considered a threat to public health due to the spread of misinformation[3].

Facebook has been studied extensively to assess its impact on global health, due to the dissemination of information across its vast population. Past studies on medical knowledge on this platform have often shown either a dearth of facts[4], or outright inaccurate or misleading reports[5]. Misinformation is often

spread on Facebook after being initially published by conspiracy sites, and although it is frequently fact-checked and discredited by doctors, health authorities and fact-checking websites, these articles collect huge numbers of likes, shares and engagements[6].

Outbreaks of disease present a unique challenge when assessing the accuracy of medical information on social media such as Facebook. Past studies have shown that false and misleading stories may be frequently posted, shared and interacted upon during a pandemic[7]. Sharma et al. showed that during the Zika virus outbreak, misleading and misguided material on Facebook was both viewed and shared at a significantly higher rate than that deemed useful[7]. This false science has real consequences, as errant beliefs may prevent patients from trusting in healthcare practitioners recommending interventions such as vaccines[8], medications or surgical therapies.

Past studies have demonstrated frameworks for the assessment of the accuracy of medical information articles on Facebook, utilizing blinded researchers to review the articles for accuracy and classifying them as accurate, inaccurate or misleading [5]. Further, Alsyounf et al classified inaccurate and misleading information based on content and reasoning such as demonstration of bias or recommendations of alternate treatments without proven benefit.

2019-nCoV (also known as Covid-19 or Coronavirus) emerged as an important pathogen at the end of 2019 and the early part of 2020. First identified in Wuhan, China, it quickly spread across the globe, and the first case was identified in the United States on January 21[9]. Given its rapid propagation, it is unsurprising that articles including reporting from traditional news media, guidance from governmental organizations, theories from conspiracy websites, as well as numerous other types of information quickly spread across social media, especially Facebook. Using a framework like those presented in past studies, the goal of this study is to assess the accuracy of the Facebook content related to Coronavirus.

Methods

The 50 most popular articles/links seen on Facebook between the period of November 1, 2019 and March 25, 2020 were identified using a social media analysis tool (BuzzSumo®; BuzzSumo, London, UK) which allows users to search for keywords across popular social media platforms such as Facebook. BuzzSumo has been used effectively to conduct scientific research on social media content[10, 11].

Search terms for the period above included both “Coronavirus” and “Covid-19”, and results were ranked by impressions (a sum of shares, comments, likes and reactions). The top 50 most-impressed articles were used for analysis. Posts by celebrities, as well as posts that included only single photos were excluded. Articles were included only if they were in the English language, and accessible at the time of study. Articles that consisted of videos or text with video were included for analysis.

These fifty articles were reviewed independently by two board-certified physicians. Accuracy was assessed by checking facts in the articles against available research data and scientific consensus on UpToDate, Pubmed and Google Scholar. Articles were then labelled as either accurate, inaccurate or

misleading. Inaccurate articles were those that contained information not supported by the most recent scientific consensus, and misleading were those found to have both accurate and inaccurate information. Lack of consensus between the two researchers was settled by a third practitioner, blinded to the prior results.

Sources for the articles were sorted into the following categories: professional or governmental organizations (such as AMA or CDC), news media (such as CNN or Wall Street Journal), entertainment/satire (such as the Daily Show or the Onion), or Other. If deemed inaccurate by the researcher, he or she was given the option to further sort that article into one of three categories: "Recommends therapy without known benefit", "Advocates for inappropriate behavior", or "Demonstrates significant bias".

Results

Buzzsumo was successfully used to isolate the 50 most popular articles on Facebook, sorted by impressions (the sum of shares, comments, likes and reactions) for the period between November 2019 and March 25, 2020. Articles related to celebrities, consisting of singular images, or not in English were not examined.

Of the 50 most popular articles during this time, 16 were deemed accurate, 9 inaccurate and 25 misleading, which is defined as containing both accurate and inaccurate information (See Figure 1). Table 1 is the summation of the data obtained for the total number of articles in each category. Table 1 further shows the total numbers of impressions, shares and comments by each type of article. Of note, the total number of articles deemed not accurate (inaccurate or misleading) is 34, translating to 68% of all articles examined.

The numbers of impressions, shares and comments are shown in Table 1 for each type of article. In addition, the numbers of inaccurate and misleading were added together and compared as a percentage of total impressions, shares and comments on Facebook, and were 71.44%, 74.97%, and 80.22% respectively. This data is presented in Figure 2, as percentages of the total articles deemed accurate, inaccurate or misleading in terms of total impressions, shares and comments.

Further analysis was conducted on the numbers of shares of each article, as a share demonstrates that the Facebook user engaged with the article, and decided to also disseminate this piece of information across his/her/their own social network. In Figure 3, the total number of shares of each of the fifty articles was broken down by accuracy type. Whereas accurate articles were shared approximately 2.2 million times, inaccurate articles were shared 2.03 million times and misleading articles 4.58 million times. This translates to 74.9% total for the inaccurate and misleading articles, although these items account for only 68% of the actual number of articles.

Although initially we ventured to sort the articles by publisher type, the articles were found to be overwhelmingly from news media organizations, and no further significant data could be gleaned from

this analysis. In addition, the further classification of inaccurate articles by the type of error committed proved to be significantly difficult because these stories had errors of multiple types that could not be easily classified.

Discussion

As one of the most popular websites in the world, and one of the busiest social networks, Facebook has incredibly large reach and impact, and is often trusted as a reliable news source. Social media's spread has enabled physicians to use it in creative manners for daily practice. These may include professional networking, professional education, organizational promotion, as well as patient care, education and public health programs[12]. Utilizing social media and online portals to communicate must be done whilst considering the reading ability and educational levels of patients, which is often significantly overestimated when preparing these materials[13].

Several methods have been proposed in the past for combatting the phenomenon of fake news on social media as related to healthcare. Medical journals have created patient-friendly pages and supplemented conventional media analysis, and proposals for further counteracting medical misinformation include containing dissemination, improving scientific literacy, health-specific education and debunking myths/discrediting purveyors[14].

Combatting the prevalent deluge of medical misinformation enables the utilization of this powerful platform in effective manners such as the prediction of diseases with a psychological component such as depression[15].

In this study, a clear preference for popularity of articles deemed inaccurate and misleading was prevalent on the Facebook social media platform. This was evidenced by 68% of the 50 most popular articles being deemed to be in these categories via independent verification. Even more interestingly, measures of advanced engagement, including impressions, shares and comments were higher proportionately in the inaccurate and misleading categories, compared to the accurate stories. Causality is hard to determine, however, as it is impossible to determine if "fake" (inaccurate or misleading) stories garner more interaction because of their accuracy or not.

In addition, sharing was found to occur much more frequently in the inaccurate or misleading articles, as these stories comprised 74.9% of shares, but only 68% of the articles. Further analysis may be able to assess if these shares are positive or negative, and the connotation with which they are shared. If one shares it to another individual for the purposes pointing out the misinformation, for instance, that is quite different from sharing it as truth.

This study was limited in that it did not assess behavioral changes, if any, due to the articles being shared on Facebook related to Coronavirus, or Covid-19. Do these articles, whether accurate, inaccurate or misleading cause any concrete behavioral changes, such as adhering to, or breaking social distancing guidelines, hand hygiene protocols or stay-at-home orders? Or are the changes more minor and insidious,

casting doubt or mistrust that will alter perception prior to a future directive? Unfortunately, these questions were outside the scope of this study, and would require large resources and long-term analysis to determine.

Conclusion

Although one of the most accessed sources of news information in the world, much of medical information shared regarding a current pandemic is either inaccurate or misleading. This has far-reaching consequences, from discouraging citizens and residents from listening to governmental or professional advice regarding social interactions, hygiene or treatment algorithms. The prevalence of inaccurate and misleading information may lead to an overall distrust of government or healthcare organizations, also leading to future difficulty in promoting social health initiatives such as vaccines or wellness checks.

The solution to medical fake news, however, is not simple to set forth. Although not a governmental organization, Facebook abides strongly by the 1st amendment limiting censorship on free speech, and avoiding removing content from its site unless necessary. Furthermore, content from other sites, to which Facebook links, is even more difficult to regulate, as it is outside the purview of the social media company.

Philosophical questions are also raised by this discussion, encompassing topics such as an individual's right to spread misinformation as a matter of opinion, or one's right to refusal of medical treatment/advice to one's own detriment. However, Facebook is not treated as, nor does it consider itself to be, a traditional media company such as a cable broadcaster or newspaper, that does filter information such as commercials deemed to be dishonest. Whether its future lies as a gateway with a duty to filter such disinformation prior to widespread dissemination or as a passive gateway simply connecting individuals remains to be seen.

Declarations

Ethics approval and consent to participate: Not applicable

Consent for publication: Not applicable

Availability of data and materials: The datasets during and/or analyzed during the current study available from the corresponding author on reasonable request

Competing interests: The authors declare that they have no competing interests

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References

1. Statista. *Number of monthly active Facebook users worldwide as of 4th quarter 2019*. 2020, January 3; Available from: [statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/](https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/).
2. Merchant, R.M., et al., *Evaluating the predictability of medical conditions from social media posts*. PLoS One, 2019. **14**(6): p. e0215476.
3. Vogel, L., *Viral misinformation threatens public health*. Cmaj, 2017. **189**(50): p. E1567.
4. Sajadi, K.P. and H.B. Goldman, *Social Networks Lack Useful Content for Incontinence*. Urology, 2011. **78**(4): p. 764-767.
5. Alsyouf, M., et al., *'Fake News' in urology: evaluating the accuracy of articles shared on social media in genitourinary malignancies*. BJU Int, 2019.
6. Independent. *Revealed: How Dangerous Fake Health News Conquered Facebook*. 2017, January 7; Available from: <https://www.independent.co.uk/life-style/health-and-families/health-news/fake-news-health-facebook-cruel-damaging-social-media-mike-adams-natural-health-ranger-conspiracy-a7498201.html>.
7. Sharma, M., et al., *Zika virus pandemic—analysis of Facebook as a social media health information platform*. American Journal of Infection Control, 2017. **45**(3): p. 301-302.
8. Merchant, R.M. and D.A. Asch, *Protecting the Value of Medical Science in the Age of Social Media and "Fake News"*. Jama, 2018. **320**(23): p. 2415-2416.
9. Paules, C.I., H.D. Marston, and A.S. Fauci, *Coronavirus Infections-More Than Just the Common Cold*. Jama, 2020.
10. Allcott, H. and M. Gentzkow, *Social Media and Fake News in the 2016 Election*. Journal of Economic Perspectives, 2017. **31**(2): p. 211-36.
11. Waszak, P.M., W. Kasprzycka-Waszak, and A. Kubanek, *The spread of medical fake news in social media – The pilot quantitative study*. Health Policy and Technology, 2018. **7**(2): p. 115-118.
12. Ventola, C.L., *Social media and health care professionals: benefits, risks, and best practices*. P t, 2014. **39**(7): p. 491-520.
13. Storino, A., et al., *Assessing the Accuracy and Readability of Online Health Information for Patients With Pancreatic Cancer*. JAMA Surg, 2016. **151**(9): p. 831-7.
14. Armstrong, P.W. and C.D. Naylor, *Counteracting Health Misinformation: A Role for Medical Journals?* Jama, 2019. **321**(19): p. 1863-1864.
15. Eichstaedt, J.C., et al., *Facebook language predicts depression in medical records*. Proc Natl Acad Sci U S A, 2018. **115**(44): p. 11203-11208.

Table

Table 1. Total number of articles and associated impressions, shares and comments sorted into accurate, inaccurate and misleading

	Accurate	Inaccurate	Misleading	Total Inaccurate + Misleading	Total Inaccurate + Misleading as percentage of total
Total Articles	16	9	25	34	68.000%
Impressions	4972400	4722400	7717500	12439900	71.443%
Shares	2211700	2035100	4588200	6623300	74.967%
Comments	143020	199700	380200	579900	80.216%

Figures

ACCURACY OF ARTICLES SHARED ON FACEBOOK

■ Accurate ■ Inaccurate ■ Misleading

Figure 1

Aggregated data for accuracy of 50 most impressed articles (impressions is sum of shares, comments, likes and reactions) on Facebook from November 2019 to period ending March 25, 2020

Percentage of Comments, Shares and Impressions on Facebook by Article Accuracy

Figure 2

Percentage of total comments, shares, and impressions of articles on Facebook sorted by accuracy

Shares on Facebook of Articles by Accuracy

Figure 3

Number of shares on Facebook of articles as sorted by accuracy